

## Three New South American Species of *Draba* (Brassicaceae)

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**ABSTRACT.** *Draba lapaziana*, *D. inquisiviana*, and *D. loayzana* are described and illustrated. All three grow in Bolivia, and the first and last also occur in Peru and Argentina, respectively. The leaf and fruit trichomes of some of these and their nearest relatives are presented.

Knowledge of the South American *Draba* is expanding considerably, and as many as 11 species have recently been added (Al-Shehbaz, 1989, 1990, 1991, 1992; Rangel & Santana, 1989). The description of three species below brings the total number of the South American *Draba* species to 70.

***Draba lapaziana*** Al-Shehbaz, sp. nov. TYPE: Bolivia. Depto. La Paz: Prov. Murillo, pass at the head of the Valle del Zongo and lower slopes of Nevado Huayna Potosí, 4,700–4,900 m, 16°17'S, 68°07'W, loose bare soil of terminal and lateral moraines, 7 Feb. 1985, *J. C. Solomon* 13219 (holotype, MO; isotypes, GH, LPB). Figures 1a, b, 2c, d.

Herba perennans pulvinata. Folia rosulata oblanceolata vel spatulata, (3–)5–8(–10) mm longa, tomentosa, pilis substellatis brevi stipitatis basi bulbosis. Scapi 5–10(–15) mm longi, apice subclavatis dense tomentosi; inflorescentiae umbellatae, 2–4-bracteatae; pedicelli fructiferi subclavati, 0.5–1.2(–2) mm longi, basi glabrescentes. Sepala oblonga, persistentia, (1.4–)1.7–2.2 mm longa; petala alba, oblanceolata vel subspathulata, 1.1–1.4 mm longa. Fructus oblongi, tomentosi, (2.1–)2.4–3(–3.3) mm longi, 1.1–1.4 mm lati. Semina ovata, 0.5–0.7(–0.8) mm longa, 4–7 in quamque loculam.

Herbs scapose, caespitose, forming cushions, 1–2 cm tall. Caudex with several to numerous fine branches each terminating in a rosette and covered with some leaf remains of previous years. Leaves rosulate, thin, oblanceolate to spatulate, (3–)5–8(–10) mm long, (0.5–)1–2(–3) mm wide, sessile, attenuate at base, entire, subacute to obtuse at apex, densely to moderately tomentose on both surfaces with short-stalked, bulbous-based, substellate trichomes with finely branched rays. Scapes 10–70, 5–10(–15) mm long, subclavate and densely tomentose near the tip, slender and sparsely hairy at base. Inflorescences 2–4-bracteate umbels; bracts

unequal, early deciduous or rarely persisting till fruit maturity. Sepals oblong, (1.4–)1.7–2.2 mm long, ca. 0.7 mm wide, narrowly scarious at margin, tomentose, persistent. Petals white, oblanceolate or subspatulate, 1.1–1.4 mm long, 0.3–0.4 mm wide, narrowed to a clawlike base. Filaments white, ca. 0.8 mm long; anthers ovate, ca. 0.2 mm long. Fruiting pedicels 0.5–1.2(–2) mm long, subclavate, tomentose, often glabrescent at base. Fruits oblong, (2.1–)2.4–3(–3.3) mm long, 1.1–1.4 mm wide, not compressed; valves obtuse at both ends, tomentelous with short-stalked furcate trichomes with few lateral branches; style 0.1–0.2 mm long. Seeds 4–7 per locule, ovate, brown, somewhat compressed, 0.5–0.7(–0.8) mm long, 0.3–0.4 mm wide.

*Draba lapaziana* is most closely related to *D. argentifolia* Al-Shehbaz, from which it is readily distinguished by its non-compressed fruits, bracteate umbels, subclavate peduncles and pedicels, and 4–7 seeds per locule. *Draba argentifolia* is a Peruvian endemic with compressed fruits, ebracteate racemes with very short rachises, cylindric peduncles and pedicels, and (10–)11–12(–14) seeds per locule. A comparison of the adaxial leaf surfaces of the holotypes of *D. lapaziana* and *D. argentifolia* (Fig. 2a, c) reveals that the trichomes in the former are finely branched, substellate, and bulbous based, whereas in *D. argentifolia* they are simple or furcate and not bulbous based. However, the paratypes of *D. lapaziana* have simple and furcate trichomes on the adaxial leaf surface. Although the fruit trichomes in both species are basically similar in branching, they are much smaller in *D. lapaziana* than in *D. argentifolia* (Fig. 2b, d).

**Paratypes.** BOLIVIA. **Depto La Paz:** Prov. Murillo, vicinity of Lago Zongo at the end of Zongo Vally, *Solomon* 13156 (GH, LPB, MO); between La Paz and Cumbre, 4,300 m, 6 Mar. 1969, *Doppelbaur s.n.* (M, MO); Chacaltaya, *Buchtien* 1873 (US). PERU. **Prov. Huarochiri:** Depto. Lima, Lago Aguascocha, near Mino Caprichosa, above Casapalca, 4,780 m, *Hutchinson & Tovar* 4265 (F, GH, MO, NY, UC, US).

***Draba loayzana*** Al-Shehbaz, sp. nov. TYPE: Bolivia. Depto La Paz: Prov. Loayza, Caxta 7 km hacia Quime, 4,540 m, 19 Feb. 1981, *St. G. Beck* 4352 (holotype, MO; isotype, LPB). Figures 1c–e, 3a, b.

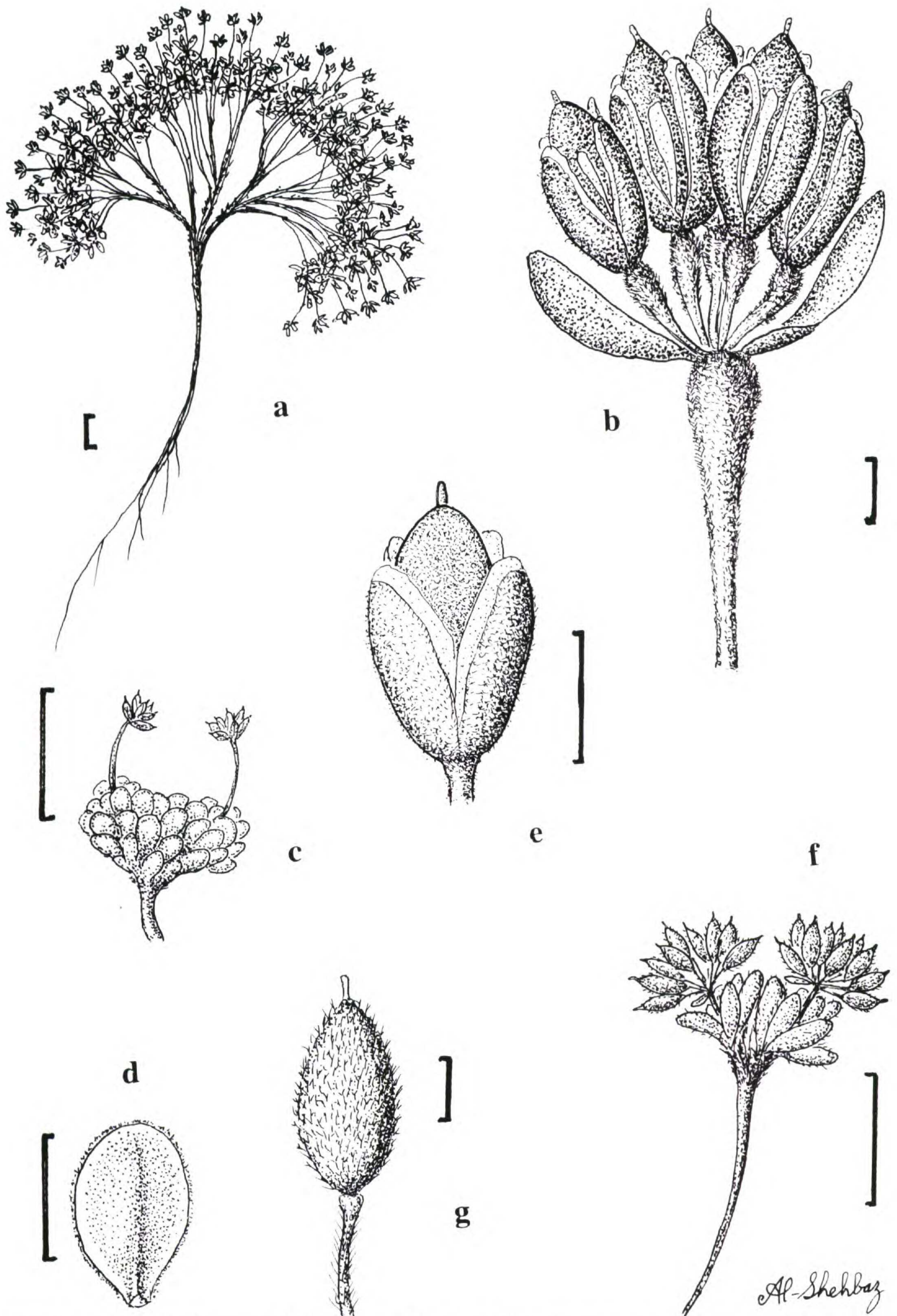


Figure 1. a, b, *Draba lapaziana* Al-Shehbaz. —a. Plant. —b. Infructescence. c–e, *D. loayzana* Al-Shehbaz. —c. Plant. —d. Leaf (abaxial surface facing). —e. Fruit. f, g, *D. inquisiviana* Al-Shehbaz. —f. Plant. —g. Fruit. Scale: a, c, f = 1 cm; b, d, e, g = 1 mm. All drawn from holotypes.

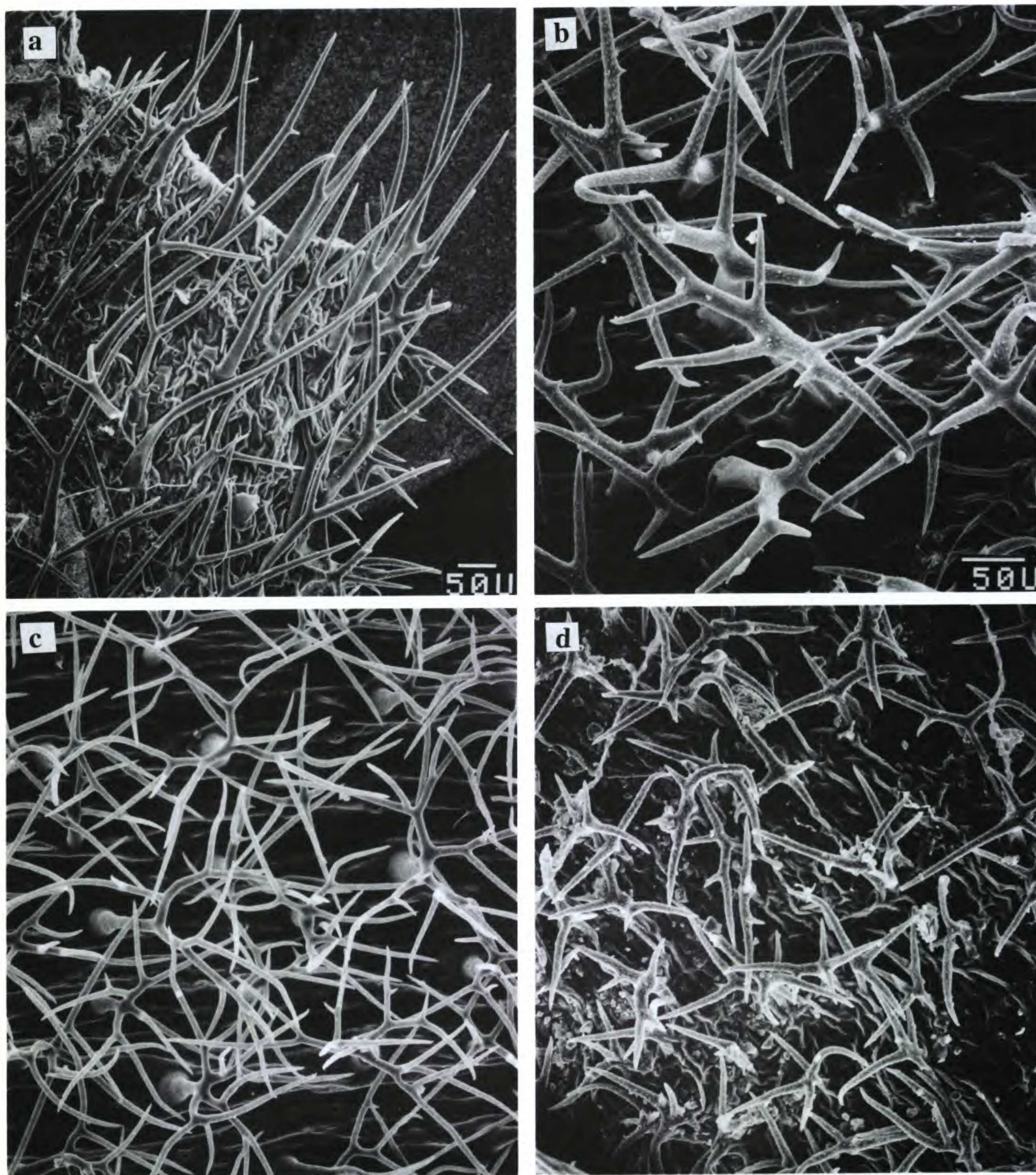


Figure 2. Leaf and fruit trichomes of *Draba argentifolia* Al-Shehbaz and *D. lapaziana* Al-Shehbaz. a, b, *D. argentifolia*. —a. Adaxial leaf surface. —b. Fruit surface. c, d, *D. lapaziana*. —c. Adaxial leaf surface. —d. Fruit surface. Scales in c, d as in b. All from holotypes.

Herba perennans nana scaposa. Folia basalia rosulata, dense imbricata, suborbiculata vel late ovata vel oblonga, crassi coriacea, (1-)2-3.5(-5) mm longa, 1-1.5(-2) mm lata, inferne glabra, superne dense tomentella, pilis longe stipitatis stellatis. Scapi 2-10 mm longi; inflorescentiae ebracteatae, subumbellatae; pedicelli fructiferi 0.7-1.3 mm longi. Sepala oblonga, persistentia, 1.5-1.7 mm longa, tomentella, marginibus membranacea; petala alba, spathulata, 1-1.3 mm longa. Fructus oblongi, compressi, 1.8-2.5 mm longi, 1.2-1.3 mm lati. Semina compressa, 0.6-0.7 mm longa, 4-7 in quamque loculam.

Herbs scapose, caespitose, tiny perennials with slender long taproots. Caudex with several short branches each densely covered with leaf remains of previous years and terminated in a rosette. Basal leaves rosulate, densely imbricate, suborbicular to broadly ovate or oblong, (1-)2-3.5(-5) mm long, 1-1.5(-2) mm wide, sessile or with a broad petiolelike base to 1.5 mm long, fleshy and appearing thick leathery upon drying, glabrous abaxially,

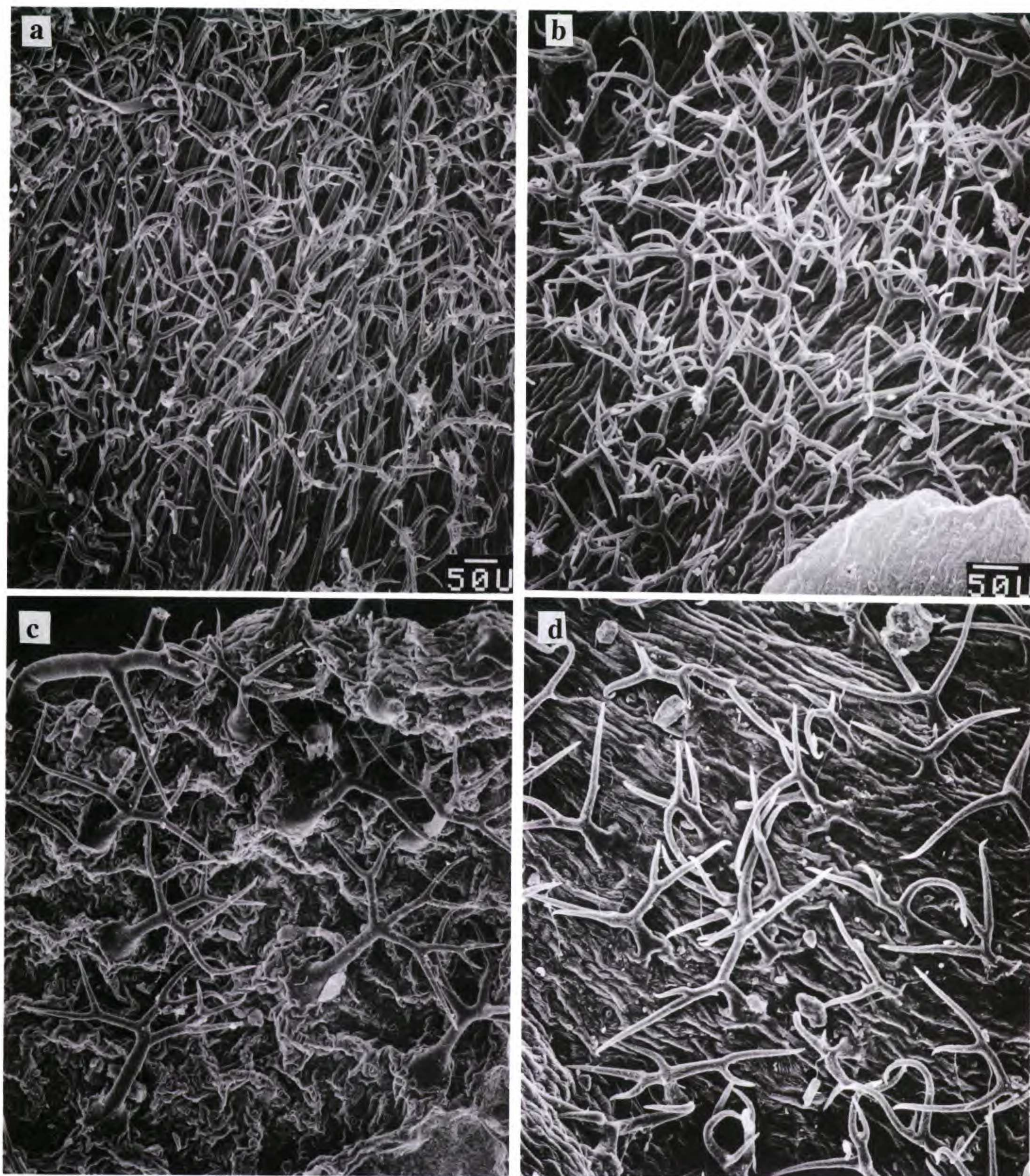


Figure 3. Leaf and fruit trichomes of *Draba loayzana* Al-Shehbaz and *D. burkartiana* O. E. Schulz. a, b, *D. loayzana*. —a. Adaxial leaf surface. —b. Fruit surface (part of persistent sepal in the lower right corner). c, d, *D. burkartiana*. —c. Adaxial leaf surface. —d. Fruit surface. Scales in c as in a, and in d as in b. All from holotypes.

densely tomentellous adaxially with long-stalked, subappressed, stellate, fine-branched trichomes often intermingled at leaf margin and apex, ciliate at least near the base, margin entire, often somewhat incurved, apex rounded to obtuse. Scapes leafless, 2–10 mm long, densely tomentellous; inflorescences (2 or)3–5(–7)-flowered, subumbellate, ebracteate racemes not elongated in fruit. Sepals oblong, 1.5–1.7 mm long, 0.6–0.8 mm wide, erect, persistent

even after fruit dehiscence, densely tomentellous outside, glabrous inside, with a membranous margin 0.1–0.2 mm wide. Petals white, spatulate, 1–1.3 mm long, 0.5–0.7 mm wide, persistent, subtruncate to shallowly emarginate at apex. Filaments white, 0.7–0.8 mm long; anthers ovate, ca. 0.17 mm long. Fruiting pedicels ascending to subdivaricate, densely tomentellous, 0.7–1.3 mm long. Fruit oblong, 1.8–2.5 mm long, 1.2–1.3 mm wide, compressed, round-

ed at both ends; valves sparsely tomentellous; style 0.16–0.2 mm long. Seeds 4–7 per locule, broadly ovate, 0.6–0.7 mm long, 0.4–0.5 mm wide, subcompressed, brown.

*Draba loayzana* is most closely related to *D. burkartiana* O. E. Schulz, which it resembles in having persistent sepals and ebracteate inflorescences. From the latter, *D. loayzana* is easily distinguished by its fleshy leaves that are adaxially densely tomentellous and abaxially glabrous, densely tomentellous sepals, oblong compressed fruits, and nonciliate petiolar leaf bases with stalked trichomes to ca. 0.4 mm long. In contrast, *D. burkartiana* has nonfleshy leaves that are glabrescent or sparsely to densely hirsute on both surfaces, glabrous or sparsely pilose sepals, ovate plump fruits, and ciliate petiolar leaf bases with simple or long-stalked furcate trichomes to ca. 1 mm long.

The leaf trichomes in *Draba loayzana* are finely branched, very dense, long stalked, and not bulbous based, whereas those of *D. burkartiana* are coarsely branched, very sparse, and bulbous based (Fig. 3a, c). The fruit trichomes in *D. loayzana* are dense and severally branched, whereas in *D. burkartiana* they are sparse and few branched (Fig. 3b, d).

Most of the plants of *Krapovickas & Fuchs 6780* (BAA) belong to *Draba macleanii* J. D. Hooker. The smaller plant previously annotated by the author as *D. cf. burkartiana* belongs to *D. loayzana*.

*Paratypes.* ARGENTINA. **Prov. Jujuy:** Depto. Yavi, Cerro Poposayo, 4,700 m, 1 Feb. 1953, *Sleumer 3703* (BAA, MO, SI). BOLIVIA. **Depto. La Paz:** Cumbre de Yungas, ca. 22 km from La Paz, 4,600 m, 15 Feb. 1950, *Krapovickas & Fuchs 6780* (BAA; fragment, MO).

***Draba inquisiviana*** Al-Shehbaz, sp. nov. TYPE: Bolivia. Depto. La Paz: Prov. Inquisivi, Cord. Tres Cruces, morrenas al lado del glaciar Atoroma-Tres Cruces, 4,800 m, 10 Feb. 1980, *E. Jordan 111* (holotype, MO; isotype, LPB). Figure 1f, g.

Herba perennans nana scaposa, 5–12 mm alta. Folia basalia rosulata, oblonga vel ovata, sessilia, 3–5(–7) mm longa, inferne pilis 2–4-furcatis stipitatis, superne pilis appressis simplicibus praedita. Inflorescentiae subumbellatae, 1–3-bracteatae; pedicelli fructiferi (1–)1.3–1.7 mm longi, pilis subappressis simplicibus. Sepala oblonga, caduca, 1.3–1.7 mm longa; petala alba, spathulata, 1.3–1.7 mm longa. Fructus lanceolati vel anguste ovati, (2–)2.3–2.7(–3.3) mm longi, pilis subappressis simplicibus et stipitatis furcatis. Semina ovoidea, compressa, 0.5–0.7 mm longa, 3–6 in quamque loculam.

Herbs scapose, caespitose, tiny perennials 5–12 mm high (including mature infructescences). Caudex

with 2–7 minute branches each terminating in a rosette and together forming a compact group 0.5–2.5 cm diam. Basal leaves rosulate, sessile, oblong to obovate, 3–5(–7) mm long, 1–2(–3) mm wide, slightly narrowed at base, abaxial surface with stalked 3-forked or cruciform trichomes, sometimes with 2-forked ones near base, adaxial surface with simple appressed trichomes 0.3–0.5(–0.7) mm long, margin entire, ciliate with simple and 2-forked trichomes, apex obtuse to rounded. Scapes leafless, (1–)3–6 mm long, densely hirsute with spreading simple trichomes to 0.7 mm long. Inflorescences subumbellate, 1–3-bracteate; rachises 0.5–1 mm long. Sepals narrowly oblong, lavender with white margin and apex, 1.3–1.7 mm long, 0.6–0.7 mm wide, caducous, entire, obtuse at apex, pubescent with simple and furcate trichomes. Petals white, spatulate, 1.3–1.7 mm long, ca. 0.5 mm wide, tapering to a clawlike base ca. 0.5 mm long. Filaments white, 0.8–1.1 mm long; anthers broadly ovate, ca. 0.15 mm long. Fruiting pedicels (1–)1.3–1.7 mm long, densely covered at least near receptacle with antrorsely appressed simple trichomes. Fruits lanceolate to narrowly ovate, (2–)2.3–2.7(–3.3) mm long, 1.2–1.4(–1.5) mm wide; valves obtuse at base, subacute at apex, densely hirsute with antrorse subappressed 2-forked and simple trichomes to 0.3 mm long at margin; styles glabrous, ca. 0.3 mm long. Seeds 3–6 per locule, ovoid, compressed, 0.5–0.7 mm long, 0.3–0.5 mm wide.

*Draba inquisiviana* is closely related to *D. discoidea* Weddell, from which it is readily distinguished by its sepals 0.6–0.7 mm wide, petals 1.3–1.6 × 0.5 mm, anthers ca. 0.15 mm long, fruiting pedicels (1–)1.3–1.7 mm long, lanceolate to narrowly ovate fruits 1.2–1.4(–1.5) mm wide, fruit valves with antrorsely subappressed trichomes, and light brown seeds 0.5–0.7 × 0.3–0.5 mm. In contrast, *D. discoidea* has sepals (0.9–)1–1.4(–1.5) mm wide, petals 2–2.3(–3) × 1–1.4 mm, anthers 0.3–0.4(–0.5) mm long, fruiting pedicels (1.5–)2–5(–8) mm long, orbicular to broadly ovate fruits (1.5–)3–4(–5) mm wide, fruit valves (when pubescent) with trichomes perpendicular to the surface, and dark reddish brown seeds (0.9–)1–1.2 × 0.7–0.8 mm. Bolivian plants described by Schulz (1927) as *D. herzogii* O. E. Schulz resemble *D. inquisiviana* in plant size and leaf indumentum and appear to be small forms of *D. discoidea*.

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